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A retrospective analysis of eclampsia as a major cause of maternal and perinatal mortality in Sagamu

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Abstract

Background: While eclampsia remains a leading cause of maternal death in the developing world, the prevalence and case fatality of the condition in the developed world has reduced due to early detection and prompt treatment. The understanding of the factors associated with eclampsia may reduce the burden and enhance the quality of foeto-maternal outcome.

Objective: To determine the prevalence of eclampsia and the associated foeto-maternal outcome.

Methods: A retrospective study of patients who presented with eclampsia at the Olabisi Onabanjo University Teaching Hospital (OOUTH) between January 2008 and December 2012 was carried out. The hospital records were retrieved and the data extracted included the age, parity, gestational age at presentation, booking status, mode of delivery, outcome of baby and mother, and the total delivery in the hospital over the period.

Results: The prevalence of eclampsia over the period was 1.1%. Eclampsia was common among women aged 25years and below (64.3%), nulliparous women (78.6%) and unbooked (100.0%). Caesarean section was carried out on 63.0% of the patients on account of unfavourable cervix, while 22.2% of patients had spontaneous vagina delivery. Most (96.4%) received magnesium sulphate ($MgSO_4$) therapy but 22.2% convulsed while receiving it. Maternal mortality was 7.1% while perinatal mortality rate was 250/1000 live birth.

Conclusion: Eclampsia remains a cause of maternal morbidity and preventable death in the understudied community. Early antenatal booking and the use of $MgSO_4$ are effective in reducing the burden.

Key words: *Eclampsia, Hypertensive disease in pregnancy, Magnesium sulphate, Stillbirth*

Introduction

Eclampsia remains a major cause of maternal mortality worldwide but particularly in the developing countries. [1,2] Eclampsia is defined as the development of convulsions and/or unexplained coma during pregnancy or postpartum in patients with signs and symptoms of preeclampsia.[3] It is estimated that every year, eclampsia is associated with about 50,000 maternal deaths worldwide, most of which occur in developing countries.

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In developed countries, the incidence of eclampsia has reportedly fallen considerably; this trend has been attributed to improvements in antenatal care service and the management of pre-eclampsia. However, in the developing countries like Nigeria, even where antenatal care may be present, it is defective in quality and utilization is poor, especially in the rural areas. [4-5] People at risk of eclampsia include primigravidae, teenagers, women older than 40 years, black race, multiple pregnancy, molar pregnancy, women with history of diabetes, hypertension or renal disease and those that did not receive antenatal care.[6] In Kano State, Nigeria, 50.3% of the patients were less than 19 years, 61.6% were primigravidae while unbooked patients accounted for 87%.[1] This pattern was similar to the findings in India where 85% of patients were less than 25years of age, 95% were

unbooked, while primigravidae accounted for 79% of eclamptic cases. [7]

The pathogenesis of eclamptic convulsions continues to be the subject of extensive investigation and speculation. Some of the etiologic mechanisms that are implicated in the pathogenesis of eclamptic convulsions included cerebral vasoconstriction or vasospasm, hypertensive encephalopathy, cerebral oedema or infarction, cerebral haemorrhage, and metabolic encephalopathy. However, it is not clear whether these findings are causes or effects of the convulsions. [3] Eclampsia is said to become more frequent as term approaches with about 50% of eclampsia occurring before delivery, 25% during labour and 25% within 48 hours postpartum. [6] In a previous study conducted in Sagamu, 93.5% of eclamptic patients had antepartum fits, 4.3% intrapartum and 2.2% postpartum. [8] That observation contrasted 38% to 53% antepartum eclampsia described by Sibai in 2005. [3]

Symptoms may occur before or after the onset of convulsions, and they include persistent occipital or frontal headaches, blurred vision, photophobia, epigastric and/or right upper-quadrant pain, and altered mental status. [3] Patients will have at least one of these symptoms in 59–75% of the cases. Headache was reported by 50–75% of the patients, whereas visual changes were reported in 19–32% of the patients. [3,7]

Most eclamptic women are delivered by emergency caesarean section mostly due to unfavourable cervix. The caesarean section rate ranged between 60% and 71.1% in some centres in south-west and north-central Nigeria respectively. [8, 9] Despite this, perinatal morbidity and mortality remain high in eclamptic pregnancies. The reported perinatal death rate in recent series ranged from 5.6% to 11.8%. [3,9] This high perinatal death rate is related to prematurity, anaemia and shock from abruptio placentae, and severe foetal growth restriction. [3] The rate of preterm delivery in eclampsia is approximately 50%, with approximately 25% of these occurring before 32 weeks of gestation. [3]

Although eclampsia is associated with an increased risk of maternal death in developed countries (0 –1.8%), [3] the mortality rate is as high as 14% in developing countries. [3] The high maternal mortality reported from the developing countries was noted primarily among patients who had multiple seizures outside the hospital and those without prenatal care. [3] In addition, this high mortality rate could be attributed to the lack of resources and intensive care facilities needed to manage maternal complications from eclampsia. [3] However maternal mortality rates as low as 2.5% and 3.3% were noted in Aba and Ilorin, in the eastern and north central parts of Nigeria respectively. [9,10] These low rates were attributed to the presence of intensive care unit and the use of magnesium sulphate ($MgSO_4$) as anticonvulsant at the centres.

Magnesium sulphate ($MgSO_4$) was first introduced to control convulsions in the year 1925, but it was the Collaborative study for eclampsia conducted in the year 1995 that confirmed the efficacy of $MgSO_4$ in the management of eclampsia. This was a randomized, placebo-controlled study that enrolled over 1687 women across a wide variety of clinical settings. [1, 11] Women treated with $MgSO_4$ had a 52% and 67% lower recurrence of convulsions compared to those treated with diazepam and phenytoin, respectively. Use of $MgSO_4$ in patients with severe pre-eclampsia reduced the risk of progression to eclampsia by more than half and reduced maternal mortality. [1, 11] On the basis of the available evidence that magnesium sulphate was associated with significantly lower rate of recurrent seizure and lower maternal mortality rate than that observed with other anticonvulsants, [1,11] the World Health Organization (WHO) has recommended Magnesium sulphate ($MgSO_4$) as the most effective, safe and low cost drug for the management of pre-eclampsia and eclampsia. [1,11,12]

The present study aimed at determining the prevalence and foeto-maternal outcome of eclampsia at the Olabisi Onabanjo University Teaching Hospital, Sagamu, over a five-year period.

Methods

This was a retrospective study of consecutive pregnant women who presented with eclampsia at the Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu, Ogun State, Nigeria between January 2008 and December 2012. The hospital records were retrieved from the Medical Records Department and the data obtained included the age, parity, gestational age at presentation, antenatal care booking status, mode of delivery, outcome of baby and mother, and the total number of deliveries for the period. Results were presented with frequency tables. Mean values and standard deviations were also determined as appropriate.

Results

There were 2,659 deliveries and 28 cases of eclampsia over the five (5) year period giving the prevalence of 1.1% (10/ 1000 deliveries). Table I shows that eclampsia was most common among the age group < 25years which accounted for 64.3% of cases while 78.6% of eclampsia occurred among nulliparous women. All the patients with eclampsia were unbooked. Singleton pregnancies accounted for 92.9% while twin pregnancy occurred in 7.1% of cases.

Table IIa shows that at presentation, the mean arterial blood pressure was 125.2 ± 21.3 mmHg; the mean systolic and diastolic pressure was 167.4 ± 29.6 and 104 ± 19.6mmHg respectively.
Majority of the eclamptic women (85.7%) had significant proteinuria and about the same proportion had more than one episode of convulsion prior to presentation. Table IIb shows that primary postpartum haemorrhage (PPH), abruptio placenta and renal failure accounted for 42.9% of maternal complications, while the Haemolysis, Elevated Liver enzymes, Low platelets count syndrome (HELLP syndrome) formed 10.7% of the complications. The mortality rate among eclamptic women was 7.1% while the perinatal mortality rate was 25.0%.

Table I: Biodata of women with eclampsia

Variable	*Frequencies*	*Percentages*	*Mean ± SD*
Age (years) (n = 28)			
<20	7	25.0	
21-25	11	39.3	
26-30	6	21.4	
31 35	3	10.7	
>35	1	3.6	23.5 ± 5.4
Parity (n = 28)			
0	22	78.6	
1	3	10.6	
2		3.6	
3	2	7.1	
Booking (n = 28)			
Unbooked	28	100.0	
Booked		0.0	
Tribe (n = 28)			
Yoruba	19	67.9	
Igbo	5	17.9	
Others	4	14.3	
Educational Level (n = 25)			
Primary	7	28.0	
Secondary	15	60.0	
Tertiary	3	12.0	
Religion (n = 28)			
Christianity	15	53.6	
Islam	13	46.4	

Some variables do not add up to 28 because some of the data were categorized as missing.

Table III shows that 63.0% of the patients had emergency caesarean section, mostly due to unfavourable cervix; 22.2% had spontaneous vaginal delivery while 14.8% had either forceps or vacuum delivery. $MgSO_4$ was used in 96.4% of the admitted patients while 22.2% had convulsion while receiving $MgSO_4$. Eighty-five percent of the patients were discharged within two (2) weeks of admission while the average hospital stay was 7.8 days.

Discussion

Eclampsia is known to be a serious cause of maternal morbidity and mortality in the African environment. The prevalence of eclampsia in this study was 1.1%; this finding was similar to the findings in earlier reports from this centre [8] and in other parts of Nigeria. [1, 2, 4] This shows that despite the difference in timing, the challenge of this disease remains about the same. It is more common when compared to United Kingdom where the incidence was put at 4.9/10,000.[13] The high prevalence in the present study can be attributed to the prevailing circumstances of poor socio-economic indices and poor utilization of antenatal service in the developing world.

Table IIa: Clinical profile of patients with eclampsia at presentation

Parameters	*Frequencies*	*Percentages*	*Mean ± SD (mmHg)*
Admission Systolic BP (mmHg)(n = 27)			
<140	3	11.1	
140-160	9	33.3	
161-200	13	48.1	
>200	2	7.5	167 ± 29.6
Admission Diastolic BP (mmHg) (n =25)			
<90		4.0	
90-110	17	68.0	
>110	7	28.0	104.0 ± 19.6
Mean Arterial Pressure (mmHg) (n = 25)			
<105	3	12.0	
105-124	9	36.0	
≥125	13	52.0	125.2 ± 21.3
Proteinuria			
None		3.6	
One +	2	7.1	
Two +	10	35.7	
Three +	14	50.0	
Number of convulsions			
1	4	14.3	
2	7	25.0	
3	10	35.7	
4	5	17.9	
5	2	7.1	

Some variables do not add up to 28 because some of the data were categorized as missing.

Therefore, the need for the education of African women on the importance of utilizing quality antenatal care and delivery services must be continuously stressed. All the women who had eclampsia were unbooked for antenatal care at the study centre. This finding agreed with previous studies where over 90% of patients were unbooked. [4,8,14,15,18] This underscores the importance of pregnancy booking and quality antenatal care which enhance early detection and management of pregnancy complications such as eclampsia.

Eclampsia is common among young adults especially women aged below 25 as previously observed in the same centre. [8] Majority (78.6%) were primigravidae. This observation showed that lack of experience in pregnancy might play a role in the burden of this condition. [16,17] Therefore, all primigravidae should receive adequate education on this disease condition so as to ensure proper decision making and develop good health care-seeking behaviour.

Proteinuria (>2+ on dipstick) was present in 50% of cases which was similar to the finding in the study carried out by Sabai. [3] This can be used to screen pregnant women before convulsions ensue in the disease. Sixty-three percent of the patients had caesarean section in concordance with the findings in a previous study carried out in the same centre but the rate was higher when compared to findings reported from other low resource centres. [4,14,16] The decision to have abdominal delivery was dependent on gestational age of foetus, state of the foetus and favourability of the cervix. [3] Therefore, there is a need for the provision of emergency obstetric care in order to improve the outcome of eclampsia in low-resource settings.

Table IIb: Clinical profile of patients with eclampsia at presentation

Parameters	*Frequencies*	*Percentages*	*Mean ± SD (mmHg)*
Estimated Gestational Age (Completed Weeks)			
28-36	12	42.9	
37-42	16	57.1	
Complications			
None	5	17.9	
Primary PPH	4	14.3	
Abruptio placentae	4	14.3	
Renal Failure	4	14.3	
HELLP syndrome	3	10.7	
Secondary PPH	1	3.5	
Postnatal psychosis	1	3.5	
CVA	1	3.5	
PCV (%) (n = 26)			
<20	2	7.7	
20-24	2	7.7	
25-29	2	7.7	
30-40	20	76.9	32.0 ± 6.5
ABO Blood Group (n = 24)			
A	3	10.3	
B	5	17.9	
O	16	57.1	
Rhesus Blood Group			
Positive	27	96.4	
Negative	1	3.6	

Some variables do not add up to 28 because some of the data were categorized as missing.

PPH –Postpartum haemorrhage
HELLP – Haemolysis, elevated liver enzyme, low platelet count
CVA – Cardiovascular accident
PCV –Packed cell volume

Over eighty five percent of the patients presented with more than two episodes of convulsion. This observation can suggest the extent of delay in

presentation to the hospital and its subsequent impact on the maternal morbidity and mortality, including foetal outcome. This study showed that maternal death was less likely to occur in patients managed with magnesium sulphate as an anticonvulsant when compared to the finding in a previous study where diazepam was used for managing eclampsia. The Case Fatality Rate in the present study was 7%which was better than the 20.4% case fatality rate recorded in a previous study done at the same centre when diazepam was the sole anti-convulsant used. [8] This observation on maternal outcome has been corroborated by the findings in relevant Cochrane systematic review which reported that the use of magnesium sulphate in eclampsia is associated with reduction in the risk maternal death when compared to diazepam. [19]

Table III: Description of the interventions for eclampsia

Parameters	*Frequencies*	*Percentages*	*Mean ± SD*
Magnesium sulphate Use			
Given	27	96.4	
Not given	1	3.6	
Mode of delivery (n = 27)			
CS	17	63.0	
SVD	6	22.2	
Forceps delivery	2	7.4	
Vacuum extraction	2	7.4	
Duration of labour (hours) (n = 7)			
<4	2	28.6	
4-11	3	42.8	
	2	28.6	8.2 ± 6.0 hours
Type of anaesthesia (n = 17)			
GA	10	58.8	
SAB	7	41.2	
Duration of hospital admission (days)			
<3	2	7.1	
3-	10	35.7	
7 14	12	42.9	
-	4	14.3	7.8 ± 5.4 days
Maternal outcome			
Alive	26	92.9	
Dead	2		
Alive	24	75.0	
Dead	8	25.0	

Some variables do not add up to 28 because some of the data were categorized as missing.
CS – Caesarean Section
SVD – Spontaneous Vertex Delivery
GA – General Anaesthesia
SAB –Subarachnoid block

The total births among women who had eclampsia was 32 (4 sets of twins inclusive), out of which eight babies died giving a perinatal mortality rate of 25%, equivalent to 250/1000. This is in contrast to the findings in United Kingdom where the perinatal mortality rate was 59/1000. [20] This can be due to prompt access to quality health care and funding through health insurance in the UK as against the preponderance of health infrastructural and manpower deficits in the setting where this study was conducted. The high perinatal mortality rate in this study was due to the high rate of intrauterine foetal death at the point of admission particularly in cases with abruptio placentae. Other causes were placenta insufficiency, perinatal asphyxia, prematurity, low birth weight and intra uterine growth restriction (IUGR).

Conclusion

Eclampsia remains a major cause of preventable death in the Nigerian setting. There is a need for increased public awareness so as to ensure timely antenatal care booking, utilization of quality antenatal services and compliance with official referrals. Magnesium sulphate has been shown to be effective in the control of eclamptic fits and reduction in maternal mortality. Accessibility of emergency obstetric care to ensure the delivery of the baby by the safest and fastest possible means will ensure improvement in the perinatal morbidity and mortality. Therefore, there is the need for skilled birth attendants to be trained and empowered to ensure appropriate care of expectant women with or at risk of eclampsia.

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